

REMARKS

The last Office Action has been carefully considered.

It is noted that claims 1-8 are rejected under 35 U.S.C. 103 over the patent to Yun or Lieberman and in view of the patents to Bennett, Reis or Senechalle.

After carefully considering the Examiner's grounds for the rejection of the claims over the art, applicants have amended claim 1, the broadest claim on file, and added a new independent claim 9.

It is believed to be advisable, before the analysis of the prior art, to explain to the Examiner the new features of the present invention which is defined in claim 1.

In accordance with the present invention, in the seismic sensor having a case, a non-conductive membrane located between two plates with one being immovable relative to the case and the other being immovable relative to the case, a mass increasing element is provided so as to increase the sensitivity of the sensor. In particular, when under the action of a seismic activity the case

of the sensor moves, the movable plate of the movable diaphragm which is thin and flexible, displaces relative to the immovable plate so that a corresponding signal is produced. When a mass increasing element is added to the thin, flexible, movable diaphragm, its displacement is increased and the sensitivity of the sensor is increased. In this particular application, and with this particular invention, the mass increasing element is formed as a case which is connected to the immovable plate.

In a copending application serial no. 10/659,298 it was proposed to form the mass increasing element as a lug located centrally on the diaphragm. This approach increases the sensitivity of the sensor. However, with sensors which are subjected to high dynamic loads, for example when they are dropped from a flying apparatus and the like, it is necessary to improve this construction. When the mass increasing lug is located on the movable plate it occupies a significant central region of the movable plate or diaphragm, increases its rigidity, and also under the action of high dynamic loads can break the thin flexible diaphragm. In connection with this, in the present application a different approach is proposed. Here the mass increasing element is a case which surrounds the plates and another elements of the sensor and at the same time, since it is not a concentrated mass increasing load, but instead is a case, it is connected to the thin, flexible diaphragm in a center by a thin elongated

connecting element so that there the additional mass does not occupy the significant part of the thin flexible diaphragm but is attached to it directly in a very small central region or central point. When the sensor is designed in accordance with the present invention with the further case connected to the thin flexible diaphragm, it increases the sensitivity of the sensor and at the same time can be used in conditions of high dynamic loads.

Also, when the sensor is designed to the present invention it is possible to use the sensor in different orientations for example vertically as shown in the drawings or horizontally when it is turned by 90° to assume a horizontal position or an intermediate position. When the mass increasing element such as for example in the above mentioned depending application is formed as a central lug, in positions different from the vertical position it deforms the movable thin diaphragm. This can not happen in the sensor with the additional diaphragm-loading case. Thus, this is an additional advantage of the suspension of the further case in accordance with the present invention

Turning now to the references, it can be seen that none of the references teaches a seismic sensor with a thin movable diaphragm in which the mass increasing element is formed as a further case connected to it.

The Examiner basically agreed that this feature is not disclosed in the prior art, but indicated that this feature is obvious. As explained herein above, the particular structural approach defined in claim 1 provides for the highly advantageous results which can not be accomplished by the constructions disclosed in the prior art or in the copending application of the applicants.

As for the obviousness rejection applied by the Examiner against the original claims, it is believed that the references taken singly or in combination with one another do not disclose the new features of the present invention. Moreover, in order to arrive at the applicant's invention from the references, the references have to be fundamentally modified by including into them the new features which are proposed first by the applicant. It is known that in order to arrive at a claimed invention, by modifying the references the cited art must itself contain a suggestion for such a modification.

This principle has also been consistently upheld by the U.S. Court of Customs and Patent Appeals which, for example, held in its decision in re Randol and Redford (165 USPQ 586) that

Prior patents are references only for what they clearly disclose or suggest; it is not a proper use of a patent as a reference to modify its structure to one which prior art references do not suggest.

Definitely, the references do not have any hint or suggestion for such features, and therefore the obviousness rejection should be considered as no longer tenable and should be withdrawn.

Also, as explained herein above, the present invention provides for the highly advantageous results which can not be accomplished by the constructions disclosed in the references. Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co., 221 USPQ 481, 485 (Fed. Cir. 1984) in which it was stated:

"Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim."

In view of the above presented remarks and amendment, claim 1, the broadest claim on file, should be considered as patentably distinguishing over the art and should be allowed.

The Examiner's attention is also respectfully directed to the features of some dependent claims.

The seismic sensor defined in claims 3 and 4 includes means for maintaining the outer casing in condition of equilibrium, which includes spring means. These features are not disclosed in the prior art.

As defined in claim 9, the further case is connected by a thin elongated connecting element located in the center of the further case and the movable plate. These features are also not disclosed in the prior art and can not be derived from them as a matter of obviousness.


Therefore, the claims related to these features should be considered as patentably distinguishing over the art not only because they depend on the presumably allowable claim 1, but also because they contain a patentable subject matter per se.

Reconsideration and allowance of the present application is most respectfully requested.

Should the Examiner require or consider it advisable that the specification, claims and/or drawings be further amended or corrected in formal respects in order to place this case in condition for final allowance, then it is respectfully requested that such amendments or corrections be carried out by

Examiner's Amendment, and the case be passed to issue. Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing this case to allowance, he is invited to telephone the undersigned (at 631-243-3818).

Respectfully submitted,


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Please extend the time of
response by 1 month and
close to 26-0085.

